THE DIFFERENCES OF STUDENTS LEARNING OUTCOMES THROUGH THINK PAIR SHARED MODEL, NUMBERED HEAD TOGETHER

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ABSTRACT

This study aims to determine differences in the students learning outcomes are taught with think pair shared and numbered head together model. The population all students of class IV. Class IVa (experiment class) amounted to 30 students and class IVb (control class) amounted to 30 students. The methods is experimental research with tye of quasi experiment research with two group pretes postes design. The instrumen used is the result of fractional learning test in the form essay and analysis using ANAVA. Average of experimental class 75,54 while control class 70. Average of experimental class 75,54 while control class 70. The result of variance analysis also shows that value of learning model significance equal to 0,048 less than value of $\alpha = 0,05$ which mean there is significant difference result of learning fraction of student taught by model of think pair shared And numbered head together in class IV SD Negeri 1 Samalanga (elementary school). So it can be concluded that the results of learning fractions of students who are taught with think pair shared models differ and show better results than model numbered headtogether learning.

Keyword: *Fractional Learning results, Numbered Head Together Model, Think Pair Shared Model.*

Introduction

Education is important in a nation's community where education is at the forefront of creating the country's development and self-sufficiency. Education is aimed at improving the quality of human resources, as defined in the national educational objectives of the National Education System Act. 20 Year 2003 (in Indonesia), article 3 is :

> "National education (Indonesia) functions to develop the ability and shape the character and civilization of a dignified nation in order to educate the nation's life, aims for the development of potential learners in order to become a man of faith and cautious to God Almighty, noble, healthy, knowledgeable, skilled, creative, Independent, and become a democratic and responsible citizen ".

The low quality of education is characterized by the low learning outcomes achieved by students in various fields of study, especially the field of study of mathematics. The result of the international survey of trends in international mathematics and science study (TIMSS) by puspendik is the score of students'

mathematics learning outcomes in Indonesia is significantly below the international average. Indonesia in 2003 ranked 35 out of 46 countries and in 2007 was ranked 36 out of 49 countries. *(http://litbangkemdiknas.net/php?id=24).*

Mathematics is one science that has an important role in human life therefore there is mathematics from basic education to the level of college. This is reinforced by mathematics is one of the subjects tested in the National Examination.

According to the Content Standards in Permendiknas (Indonesia of regulation) Number 33 of 2006 on standard content of learning mathematics aims so that students have the ability to understand mathematical concepts, using reasoning, communicating ideas, having respect, solving problems and being able to work together. This is in line with the opinion expressed by Suherman (2003: 19) "Mathematics is a science obtained by reasoning".

Based on Permendiknas (Indonesia of regulation) Number 23 of 2006 Competency Standard one of the standard of graduation for elementary / MI mathematics that is understanding the concept of integers and fractions, counting operations and its properties, and use it in solving problems of everyday life. One of the mathematics materials in the content standard for elementary / junior high school students is fractional.

The essence of mathematics is learning concepts, so learning mathematics requires special ways of learning and teaching it. Teaching is an interaction between students and teachers. A teacher strives to teach as well as possible, so that students can understand the material well according to the learning objectives. The success of the process of teaching and learning activities on learning mathematics can be measured from the success of students in following these activities. The success can be seen from the level of liveliness and student achievement. The higher the liveliness and the students' learning achievement, the higher the success rate of learning. The success of the process of teaching and learning activities of course also supported by the selection of appropriate learning methods.

Fractional is one of the concepts in mathematics. Fractions include basic concepts and are prerequisite materials for studying the types of rii numbers, complex and other numbers. Fractional numbers are numbers which can be expressed as a / b, with a and b being integers and $b \neq 0$. Number a is called the numerator and the number b is called denominator. Fractions can be said to be worth when those fractions have the same value or the simplest form.

Based on the observations made by researchers at SD Negeri 1 Samalanga show the value of grade 4 students mathematics subjects the last five years are under the minimum completeness criteria of 70 set by the school.

Table 1. Results of Mathematics Learning SD 1 Samalanga (elementary school)

Number	Year	Average
1.	2010-2011	50,00
2.	2011-2012	52,25
3.	2012-2013	54,70
4.	2013-2014	60,20
5.	2014-2015	63,00

(Source : Data Value Class IV SD Negeri 1 Samalanga)

From the data of mathematics learning result above can be seen still low result of student learning, one of the factors causing low result of student learning is model of learning. The process of learning mathematics is still centered teacher center is the transfer of knowledge from teachers to students. This model is

considered to be less exploring students' insights and knowledge. Students tend to work indvidu and lack communication with their friends in completing tasks.

Learning is essentially a process of interaction between students and students, students with learning resources and students with teachers. But in reality that happened in the field of learning process which still centered on teacher cause student less active or passive.

At this time there have been many changes in education. One is the paradigm shift that was centered on the teacher (teacher center) into student-centered learning (student center). The student-centered learning process emphasizes students to be actively involved in building knowledge, attitudes and behaviors. One of the activities that can involve students actively in building students' knowledge, attitude, behavior and interpersonal intelligence is with cooperative learning model.

Cooperative learning model was developed in an effort to increase activity with a number of students in the group (Isjoni, 2009). Eggen and Kauchak (in Trianto, 2014: 58) reveal that cooperative learning model is a group of teaching strategies that involve students working in collaboration to achieve common goals.

Think pair shared (TPS) is one of the simplest types of cooperative learning and involves many students. According to Lie (2010) explains "this think pair shared technique gives students the opportunity to work alone and cooperation with others".

The main characteristics of the learning type of think pair shared (TPS) are three main stages: thinking, pairing, and sharing. The reason the researcher chose cooperative learning model type think pair shared (TPS) because this cooperative learning model gives opportunity to think, respond and help each other and give more chance to student to be recognized and show their participation to the friend

The NHT learning model puts students in groups and is numbered then randomly. With the numbering of students trying to understand every material that is taught and responsible for their members. Trianto (2014: 62) revealed that "NHT type cooperative learning model can improve students 'learning achievement, able to deepen students' understanding".

The results of Munawaroh's (2015) study concluded that there were significant differences in the NHT and STAD learning model on learning outcomes in the cognitive and affective fields. The results of Sayun (2013) suggest that NHT type cooperative learning model is better than conventional learning model in improving students' mathematics learning achievement

Based on the above explanation, the researcher wanted to carry out a research entitled difference of fractional learning result through learning model of think pair shared and numbered head together of fourth grade students of SD Negeri 1 Samalanga. The reason researchers use this model of TPS and NHT is because there is no previous research that apply the model think pair shared and number head together simultaneously in viewing the results of fractional learning.

Method

This study was conducted in the class IV of second semester in 2016/2017 academic year SD Negeri 1 samalanga which is located at Keude Aceh street No. 3. The population of the fourth graders, namely class IVa amounting to 30 were used as experimental class and IVb totals 30 people as control class. The research method is experimental (experimental research) with research type quasi exsperiment with two group pretest postest design. The data collection technique used is the test of mathematics learning result of 10 essay questions. Scoring test result of learning mathematics C1 = 1, C2, C3 = 2, C4, C5 = 3, and C6 = 4. The initial

prerequisite test includes the population normality test using the Shapiro-wilk test and homogeneity test of the population variance using the Test of Homogeneity of Variance. Based on the analysis obtained both groups come from a population that is normally distributed, homogeneous and have the same initial ability.

## Results and Discussion

1. *Description of Research Results*

Description of the data presented in this study consists of the score of learning outcomes by using think pair shared model and numbered head together model. In this study researchers used pretest to determine the initial ability of students before being given treatment.

Table 2. Preview Data of Experiment Class and Control Class

Experiment Class			Control Class		
Score	F	F relative	Score	F	F relative
0 – 9	4	13	0 – 9	6	20
10 – 18	7	23	10 – 18	6	20
19 – 27	7	23	19 – 27	6	20
28 – 36	7	23	28 – 36	8	27
37 – 45	3	10	37 – 45	1	3
46 – 54	2	7	46 – 54	3	10
Total	30	100	Total	30	100
Mean	22,98		Mean	22,14	
Stdev	14,28		Stdev	15,68	

Based on the table above shows that the students in the experimental class have an average is 22.98, the standard deviation is 14.28 and the highest learning outcome with a score of 46 to 54 which is 2 people while in the control class with an average is 22.14, the standard deviation is 15.68 and a score of 46 to 54 amounted to 3 people. From the average of both classes have the same average learning ability capability. In summary data of pretest experimental class study and control class can be seen in Figure 1.

Figure 1. Pretest Data of Experiment Class and Control Class
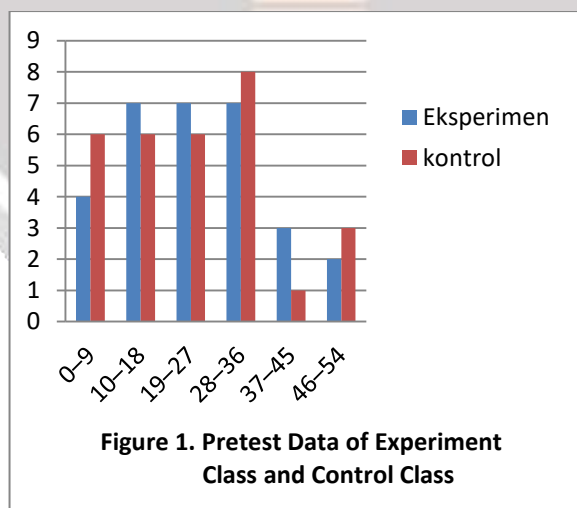
Referring to the pretest results, no student reaches the completeness according to the established KKM (low value) that is 65. So that the classical completeness of both classes is 0%.

2. *Normality Test of Pretes Data*

Normality test aims to see the distribution of student data in the two samples distributed normally or not. Calculation of normality test using Shapiro-Wilk test with SPSS 20,0.

Table 3. Normality Test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Eksperimen	,143	30	,119	,956	30	,246
Kontrol	,088	30	,200[*]	,948	30	,149

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The experimental class normality test obtained by Shapiro-Wilk value with sig 0,246 bigger than value α = 0,05 mean experiment class is normal distribution. While in control class is obtained value Shapiro-Wilk with sig 0,149 bigger than value α = 0,05 mean control class normal distribution.

3. *Homogeneity Test of Pretes Data*

Homogeneity test was conducted to find out whether the samples used in the homogeneous research or not, meaning whether the sample used represented the entire population. Homogeneity test was performed by Test of Homogeneity of Variance using SPSS 20.0.

Table 4. Homogeneity Test of Pretes Data

Test of Homogeneity of Variances

Value

Levene Statistic	df1	df2	Sig.
,333	1	58	,566

Significant value on the table above amounted to 0.566 greater than the value of α = 0.05 so it can be concluded pretest data mathematics learning result experimental class and control class has the same or homogeneous variants.

4. *Postest Data of Students*

Having obtained the initial capability of both groups of samples, then conducted learning with the think pair shared model and numbered head together model. Postes are done to find out the results of students' mathematics learning after treatment or treatment. The data of both groups of samples can be seen in the table below :

Table 5. Postest Data Learning Outcomes of Experimental class and Control Class

Experimental class			Control Class		
Class	F	F relative	Class	F	F relative
48–55	1	3,33	46–53	3	10
56-63	2	6,67	54–61	4	13,33
64–71	8	26,67	62–69	7	23,33
72–79	9	30	70–77	7	23,33
80–87	7	23,33	78–85	6	20
88–95	3	10	86–93	3	10
Total	30	100	Total	30	100
Mean	75,54		Mean	70	

Based on Table 5 shows that the students in the experimental group had the lowest learning outcomes with a score of 48 to 55 which amounted to 1 person and had the highest learning outcome with a score of 88 to 95 which amounted to 3 people with an average of 75.54 while in the control class the students had the result The lowest learning with a score of 46 to 53, amounting to 3 people and the highest learning

achievement with a score of 86 to 93 which amounted to 3 people with an average of 70. From the data postes the results of learning both the mathematics of the sample can be concluded that there is difference in the average value of postes in the class Experiments and control classes. The average comparison of pretest and postes of fractional learning results.
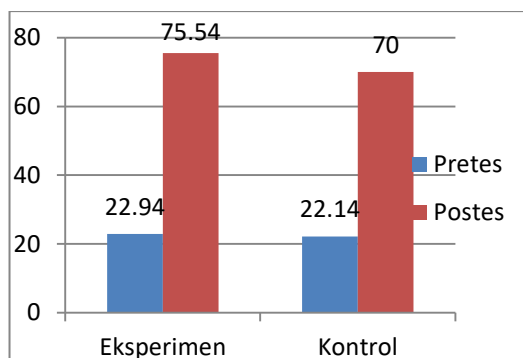

Figure 2. Pretest-Postes Diagram

Based on Figure 2 shows that the average mathematics learning outcomes have increased before and after treatment. In the experimental class there was an average increase of 52.6 while in the control class the average increase was 47.86. Postes score difference is 5.54. Based on Figure 1 it can be concluded that the fractional student learning outcomes of the experimental class is better than the students in the control class. The large increase in the average ability of students by using N-gain obtained that the two classes are in the same category are medium.

Table 6. Gain Value

	Gain Value	Gain Category
Experimental Class	0,6847	Medium
Control Class	0,6147	Medium

From the table above it can be concluded that referring to the N gain interpretation of the think pair shared learning model imposed on the experimental class and the numbered head together model imposed on the control class have the same effectiveness between the two classes that are in the medium category.

5. *Hypothesis Testing*

Hypothesis test result using SPSS 20.00 aid with General Linear Model (GLM) Univariate.

Table 7. Result of Two Ways Anova
Tests of Between-Subjects Effects
Dependent Variable: learning result

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	478,134	1	478,134	4,085	,048

a. R Squared = ,132 (Adjusted R Squared = ,086)

Test result of postes value by using anava test that is differentiate mean of experimental class postes with control class with aim to know whether there is difference of learning result fraction use mind pair share and numbered head together model. The null hypothesis is rejected if the value of significance is greater than the significance level of 0.05.

Hypothesis test results obtained significant learning model value of 0.048 with a significant level of 5%. Means This shows that the significance value <significant level or 0.048 <0.05 means Ha accepted and Ho is rejected that there are significant differences in student learning outcomes taught by the think pair shared model and numbered head together modelin class IV SD Negeri 1 Samalanga. In other words from the results of this hypothesis test can be concluded that the think pair shared model gain average value fraction learning outcomes better than numbered head together model.

Discussion

1.   Differences in Student Mathematics Learning Results with Think Pair Shared Model and Numbered Head Together Model

Cooperative learning model is a learning model that puts students in small groups whose members are heterogeneous. Among the cooperative learning model is the learning model of think pair shared and numbered head together. Cooperative learning model is in line with the theory of learning kontruktivisme and vygotsky theory.

Think pair shared learning model is a cooperative learning model that puts students in groups in pairs. This model consists of three stages of thinking (think), pairing (pairing) and sharing (shared). At the think stage, teachers ask questions and students are asked to think about it independently for a while. Stage pairing students are asked to discuss what is thought with a pair of pairs. At the stage there will be interaction between couples to discuss each other the problems posed. After the discussion between the pair then the next stage is shared that each pair reported the results of the discussion to the entire class. In this final stage will also occur question and answer between the couple on the matter discussed.

The model of learning numbered head together is a structured group work / learning system, ie, positive interdependence, individual responsibility, personal interaction, and collaborative skills in groups (Lie, 2010: 18). The model of learning numbered head together emphasizes the students to work together in groups in solving problems in groups so that each member is responsible for the results of his work.

The presentation of the model numbered head together of the teacher material will assign a number to each group member and then ask questions to the students to complete in the group. In this process students are actively involved in the group because there will be opportunities for students to interact with each other, share ideas / thoughts with their group mates. Each student must know and understand the answer of the problem and be accountable to the teacher because in the end the teacher will draw the numbers that have been distributed to present to the front of the class. Teachers only function as facilitators and direct students in learning.

Based on the data of pretest results with the model of think pair shared (experimental class) obtained pretik value of 22.94 did not reach the value of KKM 65 so that the classical completeness obtained is 0%. After the implementation of learning with Think Pair Shared model on the fractional material obtained student learning postes of 75.54. In the experimental class there are 27 out of 30 students get the value reach KKM so that classical completeness reach 90%.

While the data of pretest with model numbered head together (control class) obtained pretest value of 22.14 did not reach KKM (low score) 65 so that the obtained classical completeness is 0%. After the implementation of learning with model numbered head together on the fractional materials obtained postes of learning results of 70. There are 23 of 30 students achieve the value of KKM so that 76% classical completeness.

Average posttest class of think pair shared by 75,57 and numbered head together equal to 70, difference of learning result of fraction of second class equal to 5,57. From the results of variance analysis also shows that the significance value of the learning model of 0.048 is smaller than the value of α = 0.05 which means there are significant differences in the results of student fractional learning taught with the model think pair shared and numbered head together in class IV SD Negeri 1 Samalanga .

This is also in line with research conducted by Septriana et al (2006) concluded that student learning activity after application of TPS in cooperative learning has increased. In cycle I the percentage of success of action amounted to 65.68% in moderate category, while in cycle II increased to 85.29% in good category. The results of research conducted by Afidah et al (2015) states that there is a significant influence between the cooperative learning think pair shared on the results of learning mathematics students blind class V SDLB YPAB Tegalsagi Surabaya.

TPS type cooperative learning model encourages students to be more active in learning so that students will get a better understanding of the material and will be more interested in the material to be taught. This type of thinking pair share cooperative learning model will inculcate students' thinking processes longer and students will help each other. It is stated by Jauhari (2011) that "think pair share has explicitly defined procedures to give students more time thinking, answering and helping each other".

While cooperative learning of numbered head togehter model emphasizes students on cognitive and social emphasis. Students in doing the assigned task lead to interconnected and shared situations. The structures developed are intended to improve the acquisition of academic content and social skills that involve behaviors that make social relations successful. But in the implementation of this model that is characterized by social skills sometimes not able to produce data directly in the success of each individual in the class because with the system number head together the teacher only obtains data on student success students are appointed to provide answers to questions given, while students who No designation is not known to what degree of mastery of material they have acquired. This may be one of the causes of fractional learning outcomes taught by thin pair shared models better than learning outcomes taught degan model numbered head together.

Conclusion

Based on the results obtained from the results of data analysis and hypothesis pengujia can be concluded that the results of fractional learning with think pair shared model different and show better results with model numbered head together fourth grader SD Negeri 1 Samalanga. This is evident from the average of student learning outcomes of 75.54 from the experimental class and 70 from the control class.

Suggestion

Think pair shared learning model is one of the group activities that can be used to improve student learning outcomes in math subjects fractions in class IV of elementary school.

References

1. Afidah, N. and Andajani, S. D. (2015). *Pembelajaran Kooperatif tipe Think Pair Shared terhadap Hasil Belajar Matematika Siswa Tunanetra Kelas V SLBA*. Jurnal Pendidikan Khusus. FKIP UNESA

2. Isjoni. (2009). *Pembelajaran Kooperatif*. Yogyakarta: Pustaka Pelajar

3. Lie, A. (2010). *Cooperative Learning*, *Mempraktikkan Cooperative Learning di Ruang-Ruang Kelas*. Jakarta: Grasindo

4. Jauhari, M. (2011). *Implementasi PAIKEM dari Behavioristik sampai Kontruktivistik: Sebuah Pengembangan Pembelajaran Berbasis CTL (Contextual Teaching & Learning)*. Jakarta: Prestasi Pustakaraya

5. Munawaroh. (2015). *The Comperative Study Between the Cooperative learning Model of Number Head Together (NHT) and Studen Team Achievement in Social Subjet*. IQSR Journal of Research and Method in Education.

6. Permendiknas. (2006). *Standar Isi untuk Standar Pendidikan Dasar dan Menengah.* Jakarta: BNSP

7. Sayun. (2013). *Pengaruh Model Pembelajaran Kooperatif Tipe NHT dan bentuk Assesmen terhadap Prestasi Belajar Matematika.* Jurnal Program Pascasarjana Universitas Ganesha.

8. Septriana, N. dan Handoyo, B. (2006). *Penerapan Think Pair Share dalam Pembelajaran Kooperatif untuk Meningkatkan Prestasi belajar Geografi.* Jurnal Pendidikan Inovatif Volume 2 Nomor 1 september 2006.

9. Suherman, dkk. (2003). *Common Texs Book (Edisi Revisi) Strategi Pembelajaran Matematika Kontemporer*. Bandung: Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam UPI JICA

10. IMSS (2007). Trens in Mathematics Sciens Study. *(http://litbangkemdiknas.net/php?id=24*). Diakses September 2016

11. Trianto. (2014). *Mendesain Model Pembelajaran Inovatif-Progresif: Konsep, Landasan dan Implementasinya pada Kurikulum Tingkat Satuan Pendidikan (KTSP).* Jakarta: Kencana

12. Undang-undang Republik Indonesia Nomor 20 Tahun 2000 tentang Sistem Pendidikan Nasional. (2003). Jakarta: PT Armas Duta Jaya.